



**Solar Voltages** Dual Light-Controlled Voltage Source - Eurorack  
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Hello and thank you for using the Solar Voltages Dual Light-Controlled Voltage Source for Eurorack. We hope you will find its modulations most pleasing!

The Solar Voltages is a 2hp, 2-channel Solar Cell module which outputs two separate control voltages in response to light. Each channel outputs approximately 0-5V, with higher voltages corresponding to more intense and/or direct light. As the two channels can be manipulated with relative independence, the Solar Voltages makes for a great low-profile and multi-dimensional “light theremin” for direct and spontaneous control of two different parameters at once.

### **Technical Specifications (Eurorack standard)**

Width: 2hp

Depth: <25mm

Peak Current Draw: 0mA @ +12V, 0mA @ -12V

### 1. Installing your Solar Voltages

Use the screws provided or your own to install the Solar Voltages in your Eurorack system. Feel free to put it anywhere or even use it upside down! As the Solar Voltages gets its current from incoming light, there is no power connector. Do your best to avoid plugging the output of another module into the output of Solar Voltages: our tests indicate that it is safe from damage due to standard Eurorack modules, but better safe than sorry.

### 2. Theory of Operation

The basic concept of Solar Voltages is simple: more light equals higher voltage output. The two outputs correspond to the two Photodiode sections, with the upper section controlling Output A and the lower section controlling Output B. The front indicator line separates the two sections.

With two separate channels at one’s disposal, the Solar Voltages can be quite a fun and flexible controller. Each channel has a “viewing angle” of about 65 degrees, so the two channels can be independently controlled to some extent. As the circuit is photodiode-based, simply blocking any of the front diodes will interrupt the output voltage and place it near 0V. This makes the SV very performance-friendly and powerful for its size. Of course, multiple SV’s can be used at once to create an even more powerful “light theremin” with minimal added rackspace.

Please note: as the Solar Voltages draws a finite amount of current from incoming light, connecting an output to multiple inputs without a buffer will reduce its maximum voltage output. To increase the range when controlling multiple inputs if desired, we recommend using a buffered multiple.

### 3. Summary of Functions

**Photodiodes:** Turn light energy into electrical energy for use with your modular synth. Each channel outputs approximately 0-5V in response to incoming light, with darkness bringing the output near 0V and intense light raising the output voltage. The photodiodes can also be “strobed” at audio frequencies for interesting effects if one has the right items on hand, such as a bike light which blinks or a strobe light.

**Output A:** Control Voltage output for the upper Photodiode section.

**Output B:** Control Voltage output for the lower Photodiode section.

No calibration is required for the Solar Voltages. Enjoy your module!